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(REV. 3-90)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTORNEYS DOCKET NO.

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)**

16-124

INTERNATIONAL APPLICATION NO.
PCT/GB00/03132INTERNATIONAL FILING DATE
11 August 2000 (11.08.2000)PRIORITY DATE CLAIMED
2 September 1999 (02.09.1999)

TITLE OF INVENTION

APPARATUS FOR APPLYING SURGICAL FASTENERS

APPLICANT(S) FOR DO/EO/US

Russell David Waters

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items under 35 U.S.C. 371: 1. ■ This express request to immediately begin national examination procedures (35 U.S.C. 371(f)).

2. ■ The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees as follows:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
TOTAL CLAIMS	51- 20 =	31		x \$18.00	= \$558.00
INDEPENDENT CLAIMS	1- 3 =	0		x \$84.00	= \$0
MULTIPLE DEPENDENT CLAIMS(S) (if applicable)				+ \$270.00	
BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4)):					
<input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482)690... \$740.00					
<input type="checkbox"/> No International preliminary examination fee paid to USPTO (37 CFR 1.482) but International search fee paid to USPTO (37 CFR 1.445 (a)(2))..... \$710.00					
<input type="checkbox"/> Neither International preliminary examination fee (37 CFR 1.482) nor International search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$1040.00					
<input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provision of PCT Article 33(2) to 4)..... \$100.00					
<input checked="" type="checkbox"/> International search fee prepared by EPO (37 CFR 1.492(a)(5))..... \$890.00 \$890.00					
Surcharge of \$130.00 for furnishing the National fee or oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 mos. from the earliest claimed priority date (37 CFR 1.492(e)).					
TOTAL OF ABOVE CALCULATIONS					= \$1,448.00
Reduction by ½ for filing by small entity, if applicable. Applicant qualifies as a small entity under 37 C.F.R. § 1.27.					\$724.00
SUBTOTAL					= \$724.00
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 mos. from the earliest claimed priority date (37 CFR 1.492(f)).					
TOTAL NATIONAL FEE					\$724.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)) \$40.00					\$ 40.00
TOTAL FEES ENCLOSED					\$764.00

- a. ■ A check in the amount of \$ 764.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ■ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 23-0630.

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March 1, 2002
J. R. Waters

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PATENT AND TRADEMARK OFFICE

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ATTORNEY'S DOCKET NUMBER
16-124

3. A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
 - c. ☒ has been transmitted by the International Bureau.
4. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
5. Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
6. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
7. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) is enclosed.
8. ☐ A translation of the Annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Other document(s) or information included:

9. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☒ An assignment document for recording and an assignment recordation cover sheet.
Please mail the recorded assignment document to:
 - a. ☒ the person whose signature, name & address appears at the bottom of this page.
 - b. ☐ the following:
11. The above checked items are being transmitted:
 - a. ☐ before the 18th month publication.
 - b. ☐ after publication and the Article 20 communication but before 20 months from the priority date.
 - c. ☐ after 20 months but before 22 months (surcharge and/or processing fee included)
 - d. ☐ after 22 months (surcharge and/or processing fee included)
Note: Petition to revive (37 CFR 1.137(a) or (b)) is necessary if 35 U.S.C. 371 requirements submitted after 22 months and no proper demand for International Preliminary Examination was made by 19 months from the earliest claimed priority date.
 - e. ☒ by 30 months and a proper demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
 - f. ☐ after 30 months but before 32 months and a proper demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date (surcharge and/or processing fee included.)
 - g. ☐ after 32 months (surcharge and/or processing fee included).
Note: Petition to revive (37 CFR 1.137(a) or (b)) is necessary if 35 U.S.C. 371 requirements submitted after 32 months and a proper demand for International Preliminary Examination was made by 19 months from the earliest claimed priority date.
12. At the time of transmittal, the time limit for amending claims under Article 19
 - a. ☒ has expired
 - b. ☐ has not yet expired.
13. ☐ Certain requirements under 35 U.S.C. 371 were previously submitted by the applicant on _____, namely:
14. ☒ Enclosed is an Amendment Before Office Action.
15. ☒ Applicant qualifies as a small entity under 37 C.F.R. §127.

Kenneth J. Smith

NAME

WATTS, HOFFMANN, FISHER & HEINKE CO., L.P.A.

P.O. Box 99839

Cleveland, Ohio 44199-0839

Kenneth J. Smith
SIGNATURE

45,115

REGISTRATION NO.

Attorney's Docket No.:

I hereby declare that I am:

- NAME OF CONCERN: **Biocomposites Limited**

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 C.F.R. 121.3-18, and reproduced in 37 C.F.R. 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

Apparatus for applying surgical fasteners

[X]	the specification filed herewith	
[]	application serial no	filed
[]	patent no	issued

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organisation having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 C.F.R. 1.9(d) or by any concern which would not qualify as a small business concern under 37 C.F.R. 1.9(d) or a non-profit organisation under 37 C.F.R. 1.9(e).

* NOTE: Separate verified statements are required from each named person, concern or organisation having rights to the invention averring to their status as small entities. (37 C.F.R. 1.27)

NAME:

ADDRESS: ☐ Individual ☐ Small Business Concern ☐ Non-profit Organisation

FULL NAME:

ADDRESS: ☐ Individual ☐ Small Business Concern ☐ Non-profit Organisation

Figure 1. Schematic representation of the experimental design. The first part of the study was a 2-week pretest period during which the participants were familiarized with the tasks and the equipment. The second part of the study was the main experiment, which was divided into two phases: a 2-week familiarization phase and a 2-week testing phase. The testing phase was divided into two sub-phases: a 1-week familiarization phase and a 1-week testing phase. The testing phase was divided into two sub-phases: a 1-week familiarization phase and a 1-week testing phase. The testing phase was divided into two sub-phases: a 1-week familiarization phase and a 1-week testing phase.

NAME: **John Stephen Bratt**

SIGNATURE:

J. B. Smith

DATE: 28/1/02

PATENT
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE PATENT APPLICATION:

Biocomposites Ltd.

Serial No.: N/A Group Art Unit: N/A

Filed: Herewith Examiner: N/A

Title: Apparatus for Applying Surgical Fasteners

Docket No.: 16-124

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Assistant Commissioner for Patents
Box No Fee Amendment
Washington, D. C. 20231

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U. S. Postal Service as Express Mail addressed to the
Assistant Commissioner for Patents, Washington, D.C. 20231

March 1, 2002
J. K. Kautz

PRELIMINARY AMENDMENT

Prior to calculating the filing fee please amend the application as follows:

In the Claims:

3.(Amended) An apparatus according to claims 1 [or 2] characterised in that the supply means (46, 48, 50, 58, 66) is movably mountable on the inserting means (12).

6.(Amended) An apparatus according to [any of the preceding claims] claim 1 characterised in that the inserting means (12) comprises a support member (20, 64).

8.(Amended) An apparatus according to claim[s] 6 [or 7] characterised in that the support member (20, 64) is provided at or adjacent the passage distal end (22).

9.(Amended) An apparatus according to any of claim[s] 6 [to 8] characterised in that the supply means (46, 48, 50, 58, 66) is mountable on the support member (20, 64).

10.(Amended) An apparatus according to any of claim[s] 6 [to 9] characterised in that the passage (14) extends through the support member (20, 64).

11.(Amended) An apparatus according to [any of the preceding claims] claim 1 characterised in that the proximal end (16) of the passage (14) is shaped to aid positioning.

13.(Amended) An apparatus according to any of claim[s] 6 [to 12 when dependent on claim 6] characterised in that the support member (20) includes a pivot pin (26) upon which the supply means (46, 48, 50, 58) is pivotally mountable.

15.(Amended) An apparatus according to any of claim[s] 6 [to 14] characterised in that the support member (20, 64) is generally in the form of a disc.

16.(Amended) An apparatus according to claim 15 [when dependent on claims 13 or 14] characterised in that [the] a pivot pin (26) is spaced from the disc axis.

17.(Amended) An apparatus according to claim 10 [or any of claims 11 to 16 when dependent on claim 10] characterised in that the supply means (46, 48, 50, 58, 66) is mountable on the support member (20, 64) so as to at least generally overlies the outer end (22) of the passage (14).

18.(Amended) An apparatus according to [any of the preceding claims] claim 1 characterised in that the holding means comprises one or more first holes (54,72).

20.(Amended) An apparatus according to claim[s] 18 [or 19] characterised in that a plurality of first holes (54) are provided in the supply means (46, 48, 50, 58, 66).

21.(Amended) An apparatus according to [any of claims 18 to 20] claim 18 characterised in that the first hole or holes (54) has substantially the same diameter as the internal diameter of the passage (14).

22.(Amended) An apparatus according to claim 4 [or any of claims 6 to 21 when dependent on claim 4]

characterised in that the supply means comprises a disc (46,48,50,58).

23.(Amended) An apparatus according to claim 4 [or any of claims 6 to 22 when dependent on claim 4] characterised in that the supply means (46, 48, 50, 58) is shaped to facilitate manual turning thereof.

26.(Amended) An apparatus according to claim[s] 24 [or 25] characterised in that at least some of the lobes (62) are spaced apart to define recesses (56) therebetween.

27.(Amended) An apparatus according to [any of the preceding claims] claim 1 characterised in that one or more second holes and/or recesses (56) are provided in the supply means (46, 48, 50, 58) through which second hole or holes or recesses (56) free access is provided to the outer end (22) of the passage (14).

28.(Amended) An apparatus according to claim 5 [or any of claims 6 to 12 or 17 to 21 when dependent on claim 5] characterised in that the supply means (66) is slidably mountable on the support member (64).

30.(Amended) An apparatus according to [any of the preceding claims] claim 1 characterised in that the apparatus comprises a pushing means (28), engageable with a surgical device in the passage (14) to push the device therealong.

33.(Amended) An apparatus according to claim[s] 31 [or 32] characterised in that the elongate member (30) has a handle part (34) on one end.

34.(Amended) An apparatus according to [any of claims 31 to 33] claim 31 characterised in that the elongate member (30) is flexible.

35.(Amended) An apparatus according to [any of claims 30 to 34] claim 30 characterised in that the end (32) of the pushing means (28) engageable with a surgical device is contoured.

37.(Amended) An apparatus according to [any of the preceding claims] claim 1 characterised in that the apparatus comprises an incision means (36) extendible through the passage (14) for creating an incision.

40.(Amended) An apparatus according to claim[s] 38 [or 39] characterised in that the elongate member (38) is flexible.

41.(Amended) An apparatus according to [any of the preceding claims] claim 1 characterised in that the

supply means (46, 48, 50, 58, 66) has one or more surgical devices held thereon.

42.(Amended) A method of applying a surgical device into a body characterised in that the method comprises using apparatus according to claim 1 [any of the preceding claims].

45.(Amended) A method according to claim[s] 43 [or 44] characterised in that a plurality of surgical devices are mounted on the supply means (46, 48, 50, 58, 66).

46.(Amended) A method according to any of claim[s] 42 [to 45] when dependent on any of claims 37 to 40 characterised in that an incision is initially made in the body using the incision means (36) extending through the guide means (14).

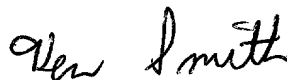
49.(Amended) A method according to any of claims 46 to 48 characterised in that following incision, the incision means (36) is removed.

Remarks

Consideration of the application in view of the present amendment is respectfully requested. In view of the foregoing, it is submitted that the application is in condition for allowance.

If necessary, the Commissioner is hereby authorized, in this concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 23-0630 for any additional fees required.

Respectfully Submitted



Kenneth J. Smith
(Reg. No. 45,115)

Dated March 1, 2007

Clean Copy of Claims as Amended

3.(Amended) An apparatus according to claims 1 characterised in that the supply means (46, 48, 50, 58, 66) is movably mountable on the inserting means (12).

6.(Amended) An apparatus according to claim 1 characterised in that the inserting means (12) comprises a support member (20, 64).

8.(Amended) An apparatus according to claim 6 characterised in that the support member (20, 64) is provided at or adjacent the passage distal end (22).

9.(Amended) An apparatus according to any of claim 6 characterised in that the supply means (46, 48, 50, 58, 66) is mountable on the support member (20, 64).

10.(Amended) An apparatus according to any of claim 6 characterised in that the passage (14) extends through the support member (20, 64).

11.(Amended) An apparatus according to claim 1 characterised in that the proximal end (16) of the passage (14) is shaped to aid positioning.

13.(Amended) An apparatus according to any of claim 6 characterised in that the support member (20) includes a pivot pin (26) upon which the supply means (46, 48, 50, 58) is pivotally mountable.

15.(Amended) An apparatus according to any of claim 6 characterised in that the support member (20, 64) is generally in the form of a disc.

16.(Amended) An apparatus according to claim 15 characterised in that a pivot pin (26) is spaced from the disc axis.

17.(Amended) An apparatus according to claim 10 characterised in that the supply means (46, 48, 50, 58, 66) is mountable on the support member (20, 64) so as to at least generally overlies the outer end (22) of the passage (14).

18.(Amended) An apparatus according to claim 1 characterised in that the holding means comprises one or more first holes (54,72).

20.(Amended) An apparatus according to claim 18 characterised in that a plurality of first holes (54) are provided in the supply means (46, 48, 50, 58, 66).

21.(Amended) An apparatus according to claim 18 characterised in that the first hole or holes (54) has substantially the same diameter as the internal diameter of the passage (14).

22.(Amended) An apparatus according to claim 4 characterised in that the supply means comprises a disc (46,48,50,58).

23.(Amended) An apparatus according to claim 4 characterised in that the supply means (46, 48, 50, 58) is shaped to facilitate manual turning thereof.

26.(Amended) An apparatus according to claim 24 characterised in that at least some of the lobes (62) are spaced apart to define recesses (56) therebetween.

27.(Amended) An apparatus according to claim 1 characterised in that one or more second holes and/or recesses (56) are provided in the supply means (46, 48, 50, 58) through which second hole or holes or recesses (56) free access is provided to the outer end (22) of the passage (14).

28.(Amended) An apparatus according to claim 5 characterised in that the supply means (66) is slidably mountable on the support member (64).

30.(Amended) An apparatus according to claim 1 characterised in that the apparatus comprises a pushing means (28), engageable with a surgical device in the passage (14) to push the device therealong.

33.(Amended) An apparatus according to claim 31 characterised in that the elongate member (30) has a handle part (34) on one end.

34.(Amended) An apparatus according to claim 31 characterised in that the elongate member (30) is

flexible.

35.(Amended) An apparatus according to claim 30 characterised in that the end (32) of the pushing means (28) engageable with a surgical device is contoured.

37.(Amended) An apparatus according to claim 1 characterised in that the apparatus comprises an incision means (36) extendible through the passage (14) for creating an incision.

40.(Amended) An apparatus according to claim 38 characterised in that the elongate member (38) is flexible.

41.(Amended) An apparatus according to claim 1 characterised in that the supply means (46, 48, 50, 58, 66) has one or more surgical devices held thereon.

42.(Amended) A method of applying a surgical device into a body characterised in that the method comprises using apparatus according to claim 1.

45.(Amended) A method according to claim 43 characterised in that a plurality of surgical devices are mounted on the supply means (46, 48, 50, 58, 66).

46.(Amended) A method according to any of claim 42 when dependent on any of claims 37 to 40 characterised in that an incision is initially made in the body using the incision means (36) extending through the guide means (14).

49.(Amended) A method according to any of claims 46 to 48 characterised in that following incision, the incision means (36) is removed.

APPARATUS FOR APPLYING SURGICAL FASTENERS

The invention relates to an apparatus for applying surgical devices to a body, and particularly but not exclusively surgical devices such as pins or tacks.

One type of surgical device which may be in the form of a pin or tack, comprises a shaft which can be inserted into the body, with formations on the shaft to prevent removal or ejection thereof from the body. A head may be provided on the shaft.

In surgical procedures which use such a fixation device for closing meniscal lesions, there is usually a requirement for insertion tooling. The purpose of this tooling is to enable the surgeon to conveniently, accurately and effectively dispense one or a combination of soft tissue fixation devices to the surgical site. This procedure is often performed under arthroscopic control. A cannula is frequently employed. A fixation device is inserted into the cannula and an obturator is used to push the fixation device along the bore of the cannula to the proximal end of the cannula and into the meniscal soft tissue. A sharp needle may be used prior to insertion of the fixation device to prepare and form a track into the meniscus for the fixation device to penetrate. The procedure of inserting the tack into the cannula can be fiddly and time consuming for the surgeon. Usually insertion instrumentation requires withdrawal from the surgical site to enable further pre-loading with fixation devices prior to subsequent device insertion. The fixation devices are loaded manually into the cannula. This can lead to contamination of the fixation device which can then result in inflammation of the tissue.

According to the invention there is provided apparatus for applying surgical devices, the apparatus comprising device inserting means which includes guide means in the form of a passage along which a surgical device is moveable, the passage comprising in use inner and outer ends; and a supply means including means for holding one or more surgical devices, the supply

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means being moveable relative to the inserting means such that in a first condition the holding means is aligned with the passage outer end such that a surgical device held by the supply means is moveable into the passage, and in a second condition free access is allowed to the outer end.

The supply means may be releasably mountable on the inserting means. The supply means may be movably mountable on the inserting means, and may be rotatably or slidably mountable.

The inserting means may comprise a support member which may be manually engageable by a user. The support member may be provided at or adjacent the passage outer end. The supply means may be mountable on the support member.

The passage may extend through the support member.

The inner end of the passage may be shaped to aid positioning and may comprise one or more pointed parts.

The support member may include a pivot pin upon which the supply means is pivotally mountable, and desirably about a hole in the supply means. The support member may be generally in the form of a disc, and the pivot pin is preferably spaced from the disc axis. The supply means is preferably mountable on the support member so as to at least generally overlies the outer end of the passage.

One or more first holes may be provided in the supply means, in which first hole or holes a surgical device is wholly locatable, with the or each first hole selectively alignable with the outer end of the passage to permit transfer of the device into the passage. One or more second holes and/or recesses may be provided in the supply means through which second hole or holes or recesses free access is provided to the outer end of the passage.

Preferably a plurality of first holes are provided in the supply means. The first hole or holes may have substantially the same diameter as the internal diameter of the passage. The supply means may comprise a disc.

The supply means may be shaped to facilitate manual turning thereof. The supply means may comprise a plurality of lobes surrounding an axis, with a first hole provided in at least some of the lobes. At least some of the lobes may be spaced apart to define recesses therebetween.

In an alternative embodiment the supply means is slidably mountable on the support member. The support member may comprise a track along which the supply means is slidable.

The apparatus may also comprise a pushing means, engageable with a surgical device in the passage to push the device therealong. The pushing means may comprise an elongate member, which desirably slidably fits through the passage, and may have a handle part on one end. The elongate member may be flexible. The end of the pushing means engageable with a surgical device may be contoured, and may be concave.

The apparatus may also comprise an incision means extendible through the passage for creating an incision. The incision means preferably comprises an elongate member, with an incision formation at one end, and desirably a handle at the other end. The elongate member may be flexible.

According to a further aspect of the invention there is provided a method of applying a surgical device into a body, the method comprising using apparatus according to any of the preceding twelve paragraphs.

Preferably the surgical device is initially located in the supply means, and this may be before the supply means is mounted on the inserting means. A plurality of surgical devices may be mounted on the supply means.

An incision may initially be made in the body using an incision means as previously described, extending through the guide means. Whilst the incision means extends through the guide means, the holding means is preferably arranged such that a second hole or recess therein overlies the guide means, and through which said second hole or recess the incision means can freely extend.

Following incision, the incision means is preferably removed. The supply means is preferably moved until a surgical device held therein overlies the guide means. The device is preferably subsequently urged into the guide means and therealong subsequently into the body using a pushing means as hereinbefore defined.

Embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:-

Fig. 1 is a diagrammatic side view of part of apparatus for applying surgical devices according to the invention;

Fig. 2 is a diagrammatic side view of a further part of apparatus according to the invention;

Fig. 3 is a diagrammatic side view of a still further part of apparatus according to the invention;

Figs. 4 to 7 are respectively diagrammatic end views of different embodiments of a part of the invention;

Fig. 8 is a diagrammatic side view of the part of Fig. 4;

Fig. 9 is a diagrammatic end view of part of the apparatus of Fig. 1; and

Fig. 10 is a diagrammatic end view of part of a further embodiment of the invention.

The drawings show apparatus 10 for applying a surgical device such as a pin or tack into a body. The apparatus 10 comprises an inserting device 12 (Fig. 1) in the form of an elongate cylindrical passage 14 extendible into a body. The proximal end 16 is shaped to provide diametrically opposite points 18 to assist with location of the end 16 in a body.

A grippable part 20 is provided on the distal end 22 of the passage 14. The part 20 has a through hole 24 through which the distal end 22 extends such that the end 22 is clear and open. The part 20 has a generally D-shape, with the hole 24 towards the stem of the D. A mounting pin 26 is provided on the part 20 centrally aligned and further from the stem than the hole 24. The pin 26 points away from the proximal end 16.

The apparatus 10 also comprises a pushing member 28 or obturator. The member 28 comprises a solid elongate shaft 30 slidably extendible through the passage 14, and of a greater length thereof. The proximal end 32 of the shaft 30 is concave to help locate the end of a surgical device thereagainst. A handle 34 is provided on the distal end of the shaft 30 to define a generally T-shape configuration with the shaft 30.

The apparatus 10 further provides an incision member 36. The member 36 is similar to the pushing member 28 with a similar shaft 38 and handle 40. In contrast, at the proximal end 42 of the shaft 38, an incision part 44 is provided, which in this instance is an elongate blade. Other shape incision parts could be used as is required.

The apparatus 10 further comprises a holding member three examples 46, 48, 50 of which are shown in Figs. 4 and 8, Fig. 5, and Fig. 6. Each of the holding members 46, 48, 50 is in the form of a disc with a central hole 52 which is removably and rotatably locatable on the pin 26 to mount the holding member 46, 48, 50 on the inserting device 12. Each of the holding members 46, 48, 50 comprises a plurality of through holes 54 and one or more circumferentially open recesses 56. The holes 54 and recesses 56 are spaced from the central hole 52 so as to be alignable with the passage 14. The holding member 46 has three holes 54 and one recess 56, whilst the holding member 48 has two holes 54 and two recesses 56, and the holding member 50 has three holes 54 and three recesses 56.

Fig. 7 shows a further possible holding member 58. The holding member 58 comprises a central hole 52 surrounded by a core part 60, and from which part 60 four similar equispaced lobes 62 radially extend. A through hole 54 is provided substantially centrally in each lobe 62. The lobes 62 are sufficiently spaced from each other to define recesses 56 therebetween. The shape of the member 58 facilitates ready gripping and turning thereof.

The apparatus 10 can be used in the following manner. The holding member 46, 48, 50, 58 is loaded with appropriate surgical devices in the through holes 54. The thickness of the holding member 46, 48, 50, 58 is chosen such that an appropriate surgical device is wholly locatable without protuberance in the holes 54. The holding member 46, 48, 50, 58 can then be mounted on the pin 26, or can subsequently be mounted on the pin 26 during an operation. The inserting device 12 is inserted in an appropriate part of the body to extend to an area where surgery is required. The points 18 help to locate and retain the device 12 in this position. If the holding member 46, 48, 50, 58 is not already mounted on the device 12, this can be accomplished once the device 12 is in position.

An incision can then be made for receiving a surgical device. This is achieved by aligning a recess 56 in the holding member 46, 48, 50, 58 with the passage 14. The incision member 36 is then slid through the respective recess 56 and the passage 14 until the incision part 44 extends beyond the proximal end 16 to permit an incision to be made.

Once an incision is completed the incision member 36 is withdrawn. The holding member 46, 48, 50, 58 is then rotated until a one of the through holes 54 which bears a surgical device is aligned with the passage 14. The pushing member 28 is then used to push the surgical device from the holding member 46, 48, 50, 58 into the passage 14 and therealong to locate in the incision. Once the surgical device is located the pushing member 28 is removed. The provision of a number of through holes 54 in the holding member 46, 48, 50, 58 allows the apparatus 10 to be used for locating a further surgical device

without loading.

Fig. 10 shows a further arrangement of a grippable part 64 and a holding member 66. In this instance the part 64 is in the form of a disc with a central opening 68. A transverse track 70 is provided in a face of the part 64. The holding member 66 is elongate with rounded ends. Three equispaced through holes 72 are provided in the member 66. This arrangement can be used in a similar manner to that described above, with surgical devices wholly located in the holes 72. To insert a surgical device the member 66 is slid along the track until a filled hole 72 overlies the opening of 68. When it is required to use the incision member 36, an empty hole 72 would overlie the opening 68, or the member 66 would be slid clear of the opening 68.

There are thus described apparatus for applying surgical devices which provides a number of advantageous features. The holding members can be filled with surgical devices prior to any operation and in clean conditions. This greatly eases what can be a fiddly job and particularly in operating circumstances. The holding member permits a number of surgical devices to be applied with the same apparatus without pre-loading required. The provision of a recess or recesses on the holding member permits an incision to be made without any obstruction or inconvenience caused by the holding member. A different holding member perhaps including further or different surgical devices could be exchanged with one already on the apparatus, during an operation. The apparatus is of relatively simple construction and can thus be inexpensively and robustly manufactured in appropriate materials.

Various other modifications may be made without departing from the scope of the invention. The holding members may take many different forms, and rather than the recesses described may comprise further through holes through which the incision member can extend. The incision member may take many different forms. Other tools may be provided which can extend through the apparatus. The grippable part may have a different shape or form, and the holding members could be differently mounted thereon. The inserting device

may be curved rather than straight, as conditions require. The pushing member and/or incision member may be hollow and/or flexible, and particularly for use with a curved inserting device. The handles on the pushing member and/or incision member may have a different shape.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

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Claims

1. Apparatus for applying surgical fixation devices, the apparatus comprising device inserting means (12) which includes guide means in the form of a passage (14) along which a surgical device is moveable, the passage (14) comprising in use proximal (16) and distal ends (22); and a supply means (46, 48, 50, 58, 66) including means (54,72) for holding one or more surgical devices, the supply means (46, 48, 50, 58, 66) being movably mounted to the distal end of the guide means such that in a first condition the supply means (46, 48, 50, 58, 66) is aligned with the passage distal end (22) such that a surgical device held by the holding means (54,72) is moveable into the passage (14), characterised in that in a second condition free access is allowed to the distal end (22) for the insertion of a surgical tool (36) through the passage (14).
2. An apparatus according to claim 1 characterised in that the supply means (46, 48, 50, 58, 66) is releasably mountable on the inserting means (12).
3. An apparatus according to claims 1 or 2 characterised in that the supply means (46, 48, 50, 58, 66) is movably mountable on the inserting means (12).
4. An apparatus according to claim 3 characterised in that the supply means (46, 48, 50, 58) is rotatably mountable on the inserting means (12).
5. An apparatus according to claim 3 characterised in that the supply means (66) is slidably mountable on the inserting means (12).
6. An apparatus according to any of the preceding claims characterised in that the inserting means (12) comprises a support member (20, 64).
7. An apparatus according to claim 6 characterised in that the support member (20, 64) is manually engageable by a user.
8. An apparatus according to claims 6 or 7 characterised in that the support member (20, 64) is provided at or adjacent the passage distal end (22).

9. An apparatus according to any of claims 6 to 8 characterised in that the supply means (46, 48, 50, 58, 66) is mountable on the support member (20, 64).
10. An apparatus according to any of claims 6 to 9 characterised in that the passage (14) extends through the support member (20, 64).
11. An apparatus according to any of the preceding claims characterised in that the proximal end (16) of the passage (14) is shaped to aid positioning.
12. An apparatus according to claim 11 characterised in that the proximal end (16) of the passage (14) comprises one or more pointed parts (18).
13. An apparatus according to any of claims 6 to 12 when dependent on claim 6 characterised in that the support member (20) includes a pivot pin (26) upon which the supply means (46, 48, 50, 58) is pivotally mountable.
14. An apparatus according to claim 13 characterised in that the supply means (46, 48, 50, 58) is pivotally mountable about a hole (52) in the supply means (46, 48, 50, 58).
15. An apparatus according to any of claims 6 to 14 characterised in that the support member (20, 64) is generally in the form of a disc.
16. An apparatus according to claim 15 when dependent on claims 13 or 14 characterised in that the pivot pin (26) is spaced from the disc axis.
17. An apparatus according to claim 10 or any of claims 11 to 16 when dependent on claim 10 characterised in that the supply means (46, 48, 50, 58, 66) is mountable on the support member (20, 64) so as to at least generally overlie the distal end (22) of the passage (14).
18. An apparatus according to any of the preceding claims characterised in that the holding means comprises one or more first holes (54,72).

19. An apparatus according to claim 18 characterised in that a surgical device is wholly locatable in the first hole or holes (54,72) with the or each first hole (54,72) selectively alignable with the distal end (22) of the passage (14) to permit transfer of the device into the passage (14).

20. An apparatus according to claims 18 or 19 characterised in that a plurality of first holes (54) are provided in the supply means (46, 48, 50, 58, 66).

21. An apparatus according to any of claims 18 to 20 characterised in that the first hole or holes (54) has substantially the same diameter as the internal diameter of the passage (14).

22. An apparatus according to claim 4 or any of claims 6 to 21 when dependent on claim 4 characterised in that the supply means comprises a disc (46,48,50,58).

23. An apparatus according to claim 4 or any of claims 6 to 22 when dependent on claim 4 characterised in that the supply means (46, 48, 50, 58) is shaped to facilitate manual turning thereof.

24. An apparatus according to claim 23 characterised in that the supply means (58) comprises a plurality of lobes (62) surrounding an axis.

25. An apparatus according to claim 24 characterised in that a first hole (54) is provided in at least some of the lobes (62).

26. An apparatus according to claims 24 or 25 characterised in that at least some of the lobes (62) are spaced apart to define recesses (56) therebetween.

27. An apparatus according to any of the preceding claims characterised in that one or more second holes and/or recesses (56) are provided in the supply means (46, 48, 50, 58) through which second hole or holes or recesses (56) free

access is provided to the distal end (22) of the passage (14).

28. An apparatus according to claim 5 or any of claims 6 to 12 or 17 to 21 when dependent on claim 5 characterised in that the supply means (66) is slidably mountable on the support member (64).

29. An apparatus according to claim 28 characterised in that the support member (64) comprises a track (70) along which the supply means (66) is slidable.

30. An apparatus according to any of the preceding claims characterised in that the apparatus comprises a pushing means (28), engageable with a surgical device in the passage (14) to push the device therealong.

31. An apparatus according to claim 30 characterised in that the pushing means (28) comprises an elongate member (30).

32. An apparatus according to claim 31 characterised in that the elongate member (30) slidably fits through the passage (14).

33. An apparatus according to claims 31 or 32 characterised in that the elongate member (30) has a handle part (34) on one end.

34. An apparatus according to any of claims 31 to 33 characterised in that the elongate member (30) is flexible.

35. An apparatus according to any of claims 30 to 34 characterised in that the end (32) of the pushing means (28) engageable with a surgical device is contoured.

36. An apparatus according to claim 35 characterised in that the end (32) of the pushing means (28) engageable with a surgical device is concave.

37. An apparatus according to any of the preceding claims characterised in

that the surgical tool is an incision means (36) extendible through the passage (14) for creating an incision.

38. An apparatus according to claim 37 characterised in that the incision means (36) comprises an elongate member (38), with an incision formation (44) at one end (42).

39. An apparatus according to claim 38 characterised in that the elongate member (38) has a handle (40) at the opposite end to the incision formation (44).

40. An apparatus according to claims 38 or 39 characterised in that the elongate member (38) is flexible.

41. An apparatus according to any of the preceding claims characterised in that the supply means (46, 48, 50, 58, 66) has one or more surgical devices held thereon.

42. A method of applying a surgical device into a body characterised in that the method comprises using apparatus according to any of the preceding claims.

43. A method according to claim 42 characterised in that the surgical device is initially located in the supply means (46, 48, 50, 58, 66).

44. A method according to claim 43 characterised in that the surgical device is located in the supply means (46, 48, 50, 58, 66) before the latter is mounted on the inserting means (12).

45. A method according to claims 43 or 44 characterised in that a plurality of surgical devices are mounted on the supply means (46, 48, 50, 58, 66).

46. A method according to any of claims 42 to 45 when dependent on any of claims 37 to 40 characterised in that an incision is initially made in the body

using the incision means (36) extending through the guide means (14).

47. A method according to claim 46 characterised in that whilst the incision means (36) extends through the guide means (14), the holding means (46, 48, 50, 58, 66) is arranged such that a second hole or recess (56) therein overlies the guide means (14).

48. A method according to claim 47 characterised in that the incision means (36) freely extends through said second hole or recess (56).

49. A method according to any of claims 46 to 48 characterised in that following incision, the incision means (36) is removed.

50. A method according to claim 49 characterised in that following removal of the incision means (36) the supply means (40,48,50,58,66) is moved until a surgical device held therein overlies the guide means.

51. A method according to claim 50 characterised in that the device is subsequently urged into the guide means (14) and therealong subsequently into the body using a pushing means (28) according to any of claims 30 to 36.

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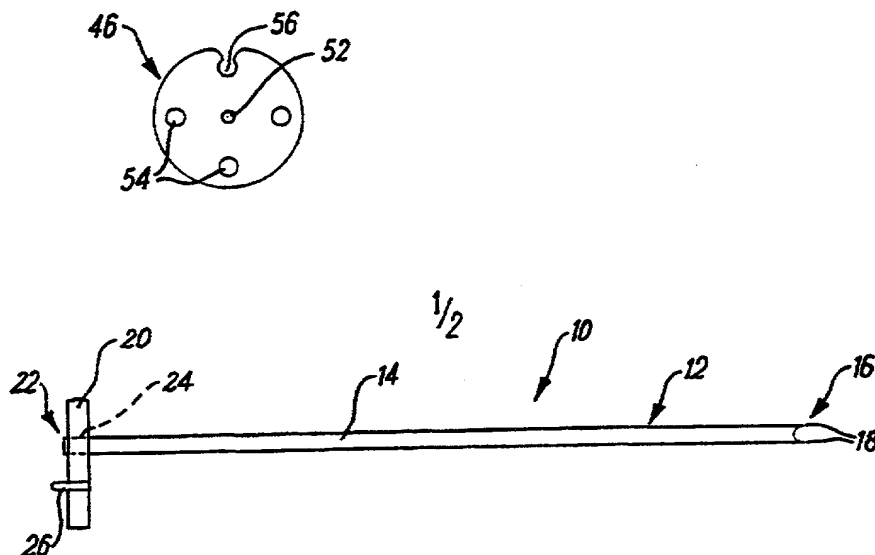
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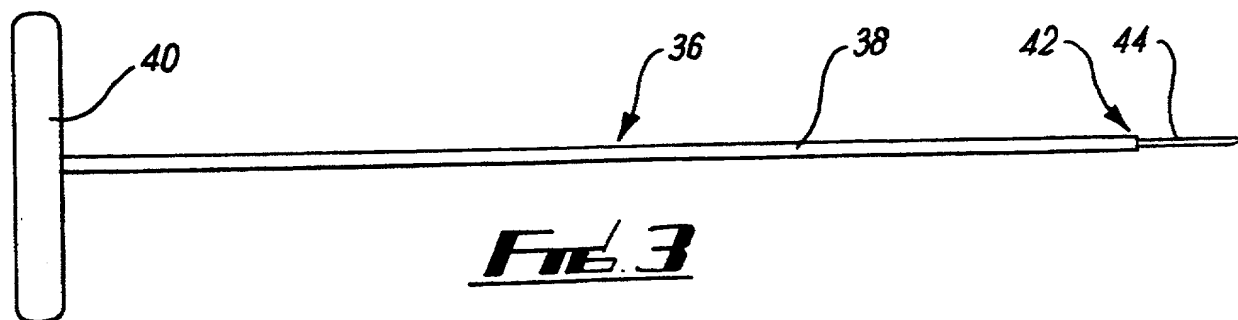
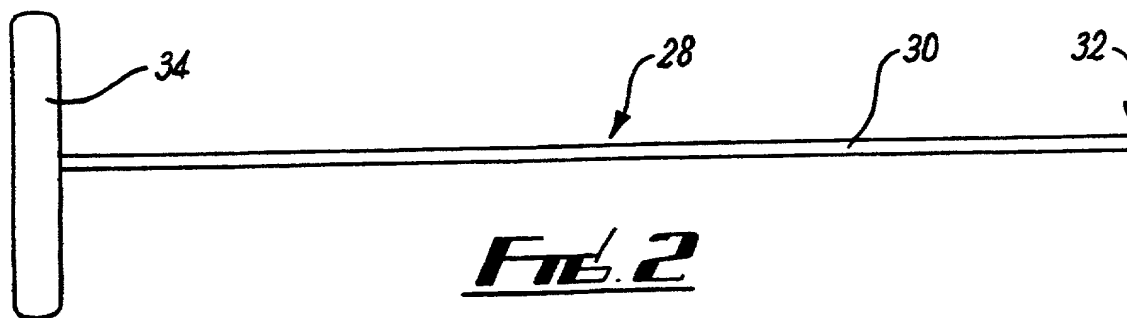
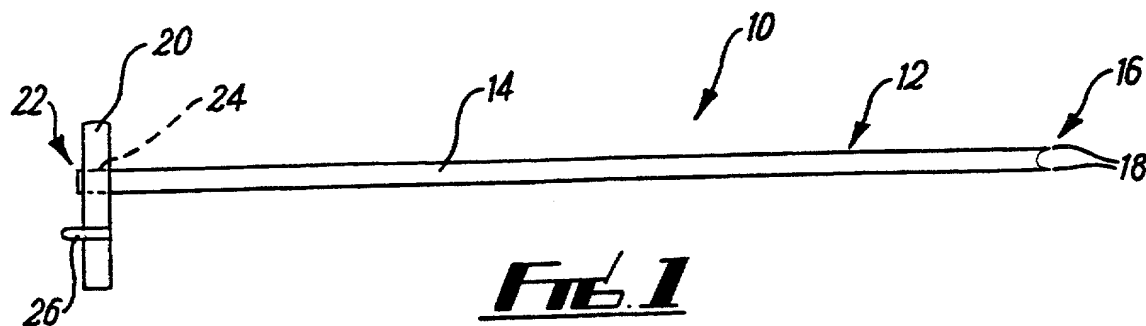
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(54) Title: APPARATUS FOR APPLYING SURGICAL FASTENERS



(57) Abstract: An apparatus and method for applying surgical devices such as pins or tacks to a body. The apparatus comprising an inserting device (12) in the form of an elongate cylindrical passage (14) extendible at one end (16) into a body, and at the other end (22) including a grippable support member (20) through which the passage (14) extends. A disc (46, 48, 50) is rotably mounted on the support member and comprises a plurality of holes (54) which can locate a surgical device, and one or more recesses (56). The disc (46, 48, 50) is mounted so as to be rotatable to a position with either a hole (54) or recess (56) overlying the passage (14) to respectively permit either a surgical device or a tool to be pushed into the inserting device (12) and hence body.

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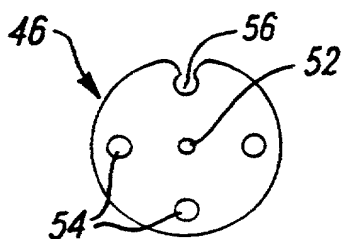


FIG. 4

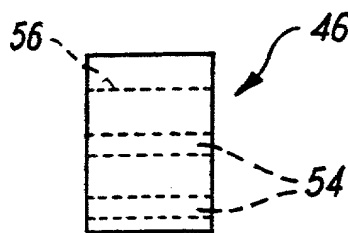


FIG. 8

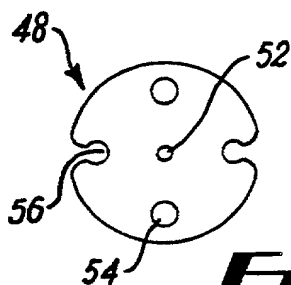


FIG. 5

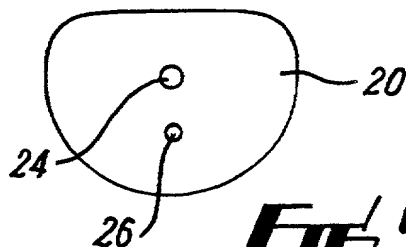


FIG. 9

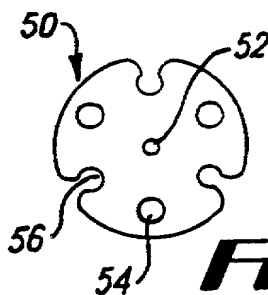


FIG. 6

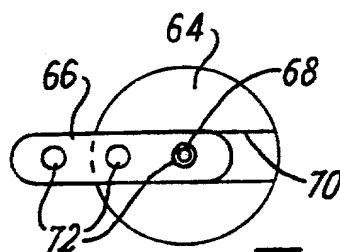


FIG. 10

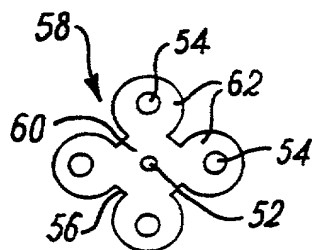


FIG. 7

Declaration and Power of Attorney for Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Apparatus for applying surgical fasteners

the specification of which:

() is attached hereto.

() was filed on
as Application serial no.
and was amended on

(X) was described and claimed in PCT International Application No.
PCT/GB00/03132, filed on **11th August 2000** and amended under PCT
Article 19 on

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

If this application is a continuation-in-part application, I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of this continuation-in-part application.

I hereby claim foreign priority under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

<u>Number</u>	<u>Country</u>	<u>Filing Date</u>	<u>Priority Claimed</u> (Yes/No)
9920623.7	United Kingdom	2nd September 1999	YES

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

<u>Application No.</u>	<u>Filing Date</u>
------------------------	--------------------

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below, and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to

disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing of this application:

Application Serial No. Filing Date Status - Patented, Pending, Abandoned

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: T.E. Fisher, Reg. No. 18,271; L.L. Heinke, Reg. No. 19,471; J.G. Watterson, Reg. No. 20,180; L.J. Raney, Reg. No. 23,078; J.R. Hlavka, Reg. No. 29,076; S.J. Schultz, Reg. No. 29,108; R.A. Sharpe, Reg. No. 34,722; G.L. Pinchak, Reg. No. 37,697; P.A. Serbinowski, Reg. No. 34,429, J. Nock-Hinton, W.A. Johnston and K.J. Smith. Send correspondence to:

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